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FOOT-OPERATED PUNCH

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The equipment herein described is a foot-operated device for punching out discs of paper or other thin material. It was designed at the European corn borer research laboratory, Toledo, Ohio, for stamping discs from sheets of paraffin paper on which egg masses of the European corn borer had been laid. By altering the size and shape of the punch it should be useful for other purposes.

The table built about the punching mechanism measures 72" x 30". It is made large, not only for the purpose of supporting the work being punched, but to hold accessory equipment and material and to provide working space for a second operator who handles the stamped-out discs.

The surface over which the paraffin sheets are moved measures 39" x 12½" and is inclined at a 23-degree angle to facilitate observation of the egg masses and for ease in handling the work.

The table stands 28½" high and is supported on a framework made of 1" angle iron 1" x 1" x ¼", all joints of which are welded.

Since (for the work for which the corn borer egg masses are utilized) it is necessary that the paper discs be mounted on pins for attachment to corn plants, a conveyor is provided consisting of a strip of cheesecloth 3-3/4" wide, hemmed on both edges, and actuated by a hand-operated crank and cylinder, moving as an endless belt through a groove 4" wide. This cheesecloth belt is supported throughout half its outward traverse on tightly stretched 40-mesh copper screen, which supports the disc while a pin is being pushed through.

The details of the punching mechanism are shown in figure 1, which is drawn to scale.

The stripping member (fig. 1-A) of the punch consists of a 30" piece of channel iron, 2" x 1" x ¼". This is welded to the bolster member (fig. 1-B) throughout 11 inches of its length, leaving a space (fig. 1-K) 1/4" wide and 7" long at its lower end

through which the work is moved. In order to obtain the necessary extreme rigidity of the bolster, it is made of T-iron, 2" x 2½" x ¼". Details of the foot-operated treadle (fig. 1-L) and the spring return mechanism (fig. 1-H) are shown in the diagram.

Accurate milling of the shearing punch (fig. 1-J) and its die is essential for forming clean-cut discs. Figure 2 shows the machine ready for operation.

In using the machine the operator moves the sheet over the inclined part of the table through the slot until an egg mass is centered over the shearing punch. This position is determined by looking through the die, the egg masses, which are laid on only one surface of the paper, being on the upper surface during the punching operation and visible to the operator. When the treadle is then depressed, the disc with its attached egg mass is cut out and forced upward, and is removed with tweezers from the top of the shearing punch and placed on the conveyor. A tally (fig. 1-C), fastened to the upper end of the T-iron and actuated as shown in the diagram, keeps count of the number of egg masses punched out.

The use of this device greatly increased the output of pinned discs. Three operators, one punching out the discs, and the others pinning them, can produce 10,000 pinned discs per day.

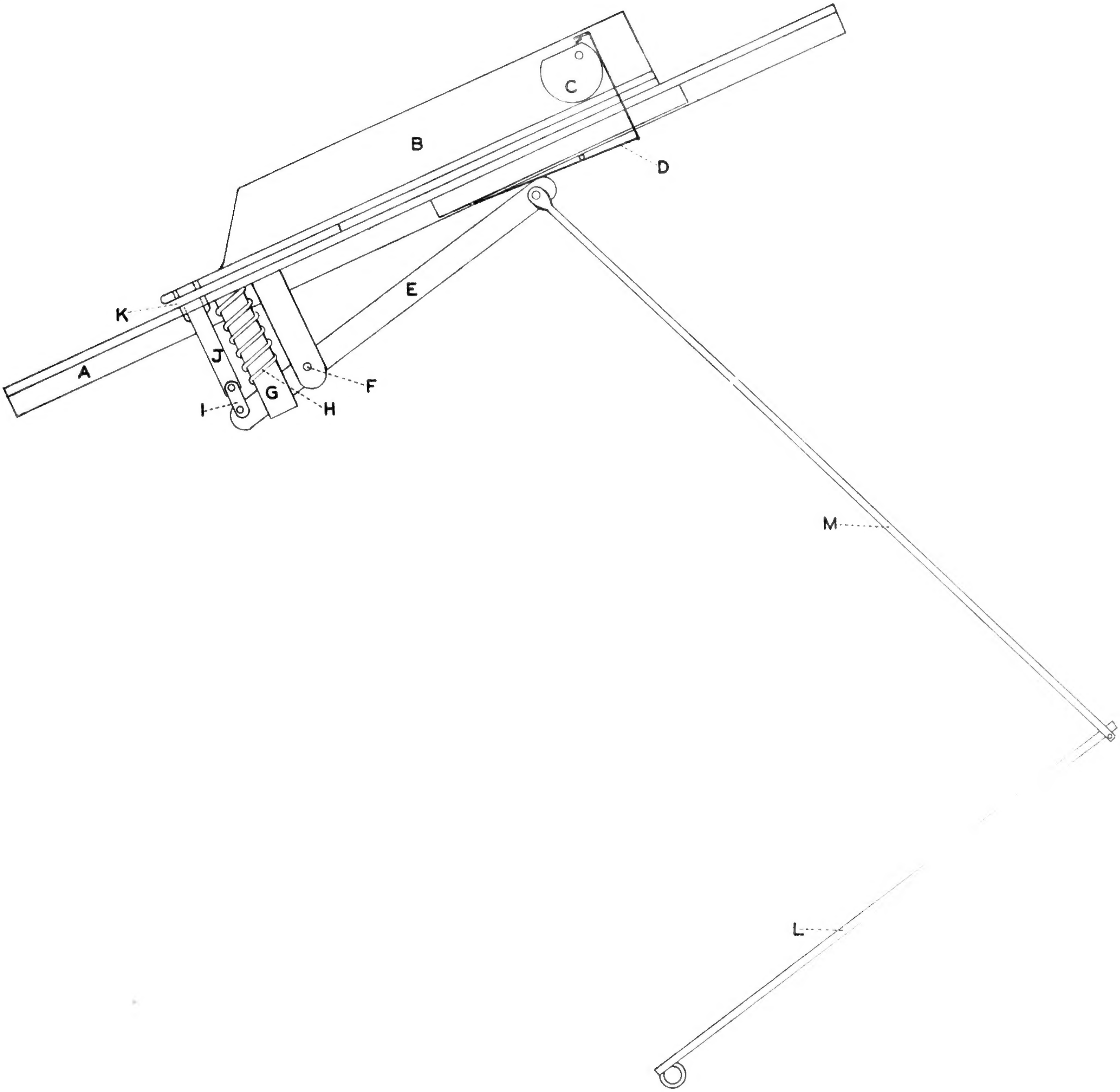

Figure 1.--Diagram showing operating mechanism of foot-operated punch: A, Stripper. B, Bolster. C, Tally. D, Lever operating tally. E, Punch lever. F, Punch lever pivot. G, Slotted lever guide. H, Return spring. I, Shackle. J, Shearing punch. K, Slot through which work is moved. L, Treadle. M, Treadle connecting rod.

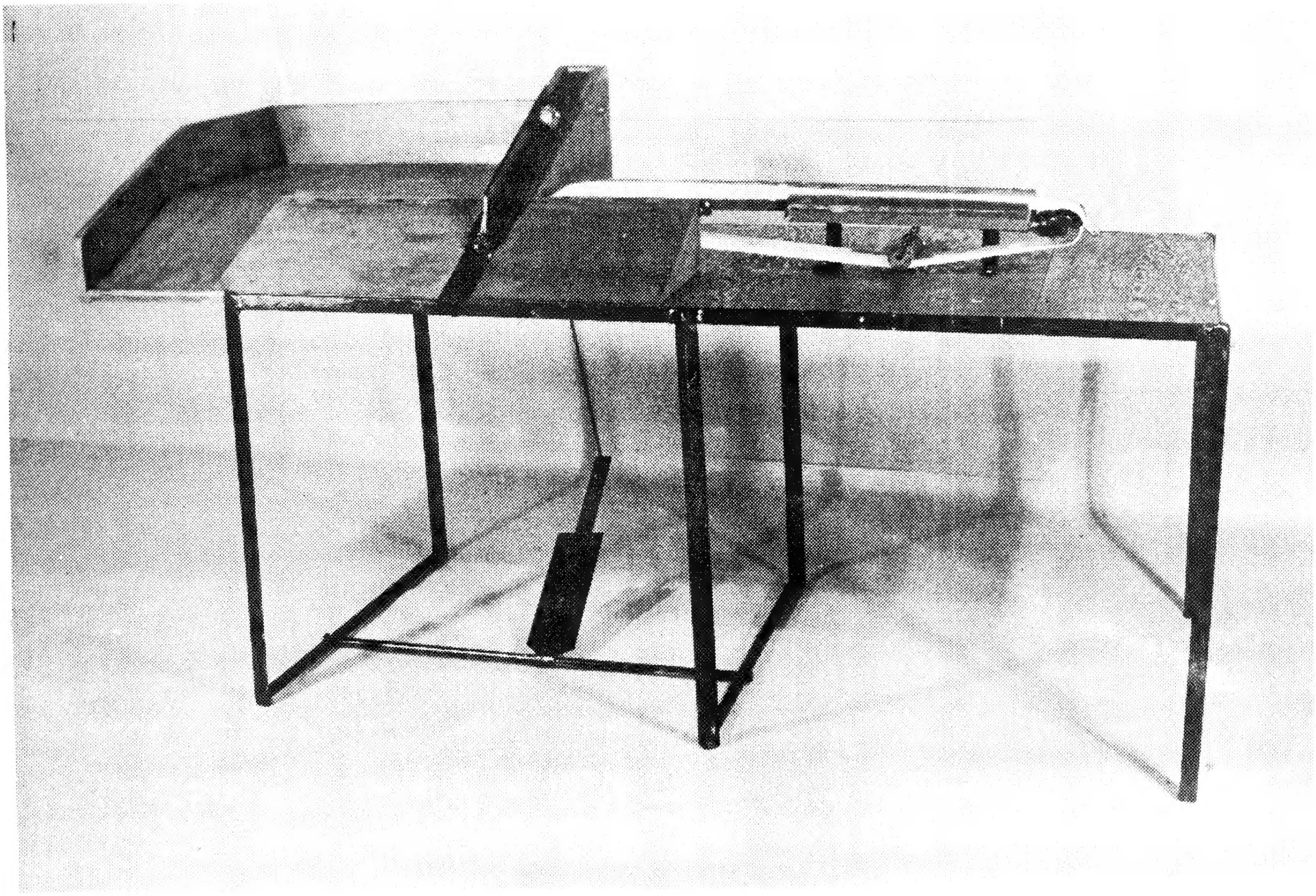

Figure 2.--Foot-operated punch for cutting out egg masses of the European corn borer on discs of waxed paper.